

physically, by insulating the aramidic fibres from contact with the upper layers of the conductor. The sheath will also be useful as an element for keeping the yarns confined and compact, and for protecting the aramidic fibres against exposition to UV radiations.

[0054] It will be considered herein the use of a sheath made of elastomeric polymeric material, such as, by way of non-limiting example, Hytrel® (thermoplastic elastomer polyester) or TPU (thermoplastic polyurethane), resistant to temperatures up to 150° C. When properly blended with additives, pigments and stabilizers, such as, by way of non-limiting example, hindered amine light stabilizers (HALS), it can resist the environmental aggression caused by ultraviolet radiations, humidity, organic solvents, polar solvents and diluted acidic and basic solutions.

[0055] With reference to FIGS. 1a, 1b, there is shown a conductor for electric lines, designated as a whole by reference numeral 1.

[0056] The conductor 1 comprises a load-bearing core 4, on which conductors 3 for electric energy transportation are arranged.

[0057] The core 2-4 is made out of one or more ropes 4 of wires of aramidic fibres wrapped in a thermoplastic sheath.

[0058] Preferably, the aramidic fibres have a diameter between 1 and 100 microns.

[0059] Preferably, the core has a diameter between 1 and 100 millimetres.

[0060] The aramidic fibres are assembled by means of a containment sheath capable of withstanding high temperatures for a time compatible with the life of a common conductor with a steel load-bearing element.

[0061] The thermoplastic sheath 2 that surrounds the rope 4 is applied by high-pressure plastic extrusion.

[0062] The thermoplastic sheath 2 is extruded on the rope 4 of aramidic fibres for containing them and also for preventing them from being damaged by UV solar rays, as previously described. Said sheath, which is made of, by way of non-limiting example, Hytrel® or TPU, is resistant to temperature peaks of 150° C. and can work for up to 40 years at operating temperatures of 120° C.

[0063] Moreover, the conductor 1 comprises a plurality of conducting wires 3 laid (wound in a spiral pattern) over the core 2-4, so as to define a circular crown around the core 2-4.

[0064] In other examples, however, there may be more than one circular crown of conducting wires 3, arranged concentrically one over the other; advantageously, the overlapped circular crowns of conducting wires 3 may be as many as five.

[0065] The conducting wires 3 have a circular cross-section or may be shaped like a circular crown sector; as an alternative, they may have any other cross-section compatible with the application of the conductor 1 within the frame of electric energy transmission.

[0066] The conducting wires 3 are made of annealed aluminum with a purity higher than 99.5% or Al—Mg—Si or Al—Mn or Al—Zr alloys or other aluminum alloys for electric use.

[0067] In a preferred but non-limiting embodiment, the aramidic fibres are made of Kevlar® or Twaron® or Zylon®, the sheath 2a of the core 2 is made of Hytrel® or TPU thermoplastic elastomer polyester, and the conducting skirt is formed by conducting wires 3 made of Al—Zr alloy.

[0068] The operation of the conductor 1 according to the invention is apparent in the light of the above description and of the annexed drawings, being substantially as follows.

[0069] When the conductor 1 is installed, the core 2-4 (comprising the rope 4 of aramidic fibres and the sheath 2) supports the conductor 1, while the conducting wires or 3 are particularly dedicated to energy transportation.

[0070] When in operation, after span installation, the temperature of the conductor rises and, beyond a certain predetermined value (stress transition point or knee-point), detachment will occur between the core (comprising the rope 4 and the sheath 2) and the crowns of conducting wires 3, due to their different thermal expansion.

[0071] Then, as temperature increases further, the conductor 1 will expand according to the expansion coefficient of the core (which is extremely small), and not according to the average expansion coefficient of the conductor 1 as a whole (including the conducting wires 3, which is much higher because of the higher percentage of aluminum or alloys thereof).

[0072] This will cause the span deflections to remain compatible with the safety regulations notwithstanding the high temperatures (>100° C.).

[0073] It is clear from the above description that the electric conductor of the present invention is suitable for applications at operating temperatures above 90° C., and with a thermal expansion coefficient lower than $18 \cdot 10^{-6}/^{\circ}\text{C}$.

[0074] The conductor thus conceived for installation on current electric lines as a replacement for current conductors requires suitable terminal couplings. The optimal solutions is a configuration based on the friction developed on a conical insert.

[0075] The load is distributed evenly over the fibres thanks to the cone that presses against just one layer of fibres on the respective insert. Once in traction, the fibres will drag the cone by friction, thereby tightening the fibres by compression.

[0076] FIG. 5 shows an example of embodiment of a coupling terminal adapted to couple the terminal part of the electric conductor to the electric line pylon.

[0077] The coupling terminal essentially comprises the following elements:

[0078] an end cap 51, comprising on one side a pin 52 to be coupled to the pylon, and on the other side a threaded opening 53;

[0079] a hollow termination body 54 with a truncated-cone shape, having on its bigger side a thread 55 adapted to be screwed into the threaded opening 53;

[0080] a tightening cone 56 adapted to be inserted into the hollow termination body 54, so as to tighten said plurality of aramidic fibres of the terminal part of the conductor into the hollow termination body 54;

[0081] preferably, there is also a gasket 57 that seals the hollow termination body.

[0082] First of all, after removing the first part of the external gasket for a length equal to that of the tightening cone 56, the rope 58 will have to be inserted into the hollow termination body 54, preferably made of aluminum alloy (or steel). Then all the fibres released by the gasket will have to be arranged properly: in fact, the yarn will have to be open relative to the centre, and the fibres will have to be properly separated from one another and evenly distributed in just one layer. Finally, the cone 56 will have to be inserted with